

The documentation and process
conversion measures necessary to
comply with this amendment shall
be completed by 12 December 1992

INCH-POUND

MIL-S-19500/569
AMENDMENT 3
12 June 1992
SUPERSEDING
AMENDMENT 2
8 September 1989

MILITARY SPECIFICATION

SEMICONDUCTOR DEVICE, FIELD EFFECT TRANSISTOR, N-CHANNEL, SILICON
TYPES 2N6966, 2N6967, 2N6968, and 2N6969
JANTX, JANTXV, AND JANS

This amendment forms a part of MIL-S-19500/569, dated
15 September 1987, and is approved for use by all Depart-
ments and Agencies of the Department of Defense.

PAGE 1

1.3, maximum ratings, I_{D1} column: Delete "mA" and substitute "A".

PAGE 3

4.1, Screen 12, JANS column, after condition A: Add ";", after see (4.3.1): Add "condition C shall precede condition A".

4.3.1, second line: Delete "-0°C," and substitute "-5°C,"

PAGE 4

4.5.3, delete the main text only and substitute the following:

"Thermal response (ΔV_{SD} measurements). The delta V_{SD} measurements shall be performed in accordance with method 3161 of MIL-STD-750. The delta V_{SD} conditions (I_H and V_H) and maximum V_{SD} limit shall be derived by each vendor from the thermal response curves (see figure 2). The chosen ΔV_{SD} measurement and conditions for each device in the qualification lot shall be submitted in the qualification report. The chosen ΔV_{SD} shall be considered final after the manufacturer has had the opportunity to test five consecutive lots."

PAGE 11

TABLE I, subgroup 2, gate current, conditions column: Delete " $V_{GS} = \pm 20$ V dc," and substitute " $V_{GS} = +20$ and -20 V dc,".

TABLE I, subgroup 2, static drain to source "on"-state resistance, condition column: Delete " $I_D = 10$ A dc, $I_D = 7$ A dc, $I_D = 6.2$ A dc, $I_D = 3.3$ A dc" and substitute " $I_D = \text{rated } I_{D2}$ (see 1.3)".

*The attached insertable replacement pages listed below are replacements for stipulated pages. When the new pages have been entered in the document, insert the amendment as the cover sheet to the specification.

Replacement page
13
14

Page replaced
13
14

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PAGE 12

TABLE I, subgroup 2, forward transconductance, conditions column: Delete "Pulsed (see 4.5.1)" and substitute " $I_D = \text{Rated } I_{D2}$ (see 1.3), Pulsed (see 4.5.1)".

TABLE I, subgroup 3, gate current, conditions column: Delete " $V_{GS} = \pm 20 \text{ V dc}$ " and substitute " $V_{GS} = +20 \text{ V dc}$ and -20 V dc ".

*TABLE I, subgroup 4, delete in its entirety and substitute the following:

		MIL-STD-750	LTPD 1/					
Inspection	Method	Conditions	JANS	JANTX, JANTXV	Symbol	Min	Max	Unit
<u>Subgroup 4</u>								
Switching time test	3472	I_D = Rated I_{D2} (see 1.3) V_{GS} = 10 V dc Gate drive Impedance = 7.50Ω						

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TABLE IIa, subgroup 4, intermittent operation life, conditions column: Delete "see 4.3.1".

TABLE IIa, subgroup 4, intermittent operation life, method column: Delete "1037" and substitute "1042".

TABLE IIa, subgroup 5, accelerated steady state operation life, conditions column: Delete " $T_J = 200^\circ\text{C}$ ", and substitute "(except) $T_J = +200^\circ\text{C}, +20^\circ\text{C}, -0^\circ\text{C}$ ".

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TABLE IIb, subgroup 3, intermittent operation life, conditions column: Delete "A" and substitute "The heating".

PAGE 19

TABLE III, subgroup 2, terminal strength (lead torque), conditions column: Delete "6 in-oz." and substitute "3 in-oz".

TABLE III, subgroup 2: Delete "Visual and mechanical evaluation, method 2071".

PAGE 20

TABLE III, subgroup 6, intermittent operation life, conditions column: Delete "A" and substitute "The heating".

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TABLE IV, step 3, gate current, conditions column: Delete " $V_{GS} = \pm 20$ V dc," and substitute " $V_{GS} = +20$ and -20 V dc,".

TABLE IV, step 5, static drain to source on-state resistance, conditions column: Delete " $I_D = 10$ A dc, $I_D = 7$ A dc, $I_D = 6.2$ A dc, $I_D = 3.3$ A dc" and substitute " $I_D = \text{rated } I_{D2}$, (see 1.3)".

TABLE IV, step 6, drain to source on-state voltage, maximum limits column: Delete

"	0.085	
	1.26	
	3.41	
	2.81	"

and substitute

"	1.7	
	2.4	
	4.13	
	5.1	"

*TABLE IV, step 8, min/max column: Delete footnote "1/."

TABLE IV, delete footnotes 1/ and 2/ in their entirety.

The margins of this amendment are marked with an asterisk to indicate where changes (additions, modifications, corrections, deletions) from the previous amendment were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the last previous amendment.

CONCLUDING MATERIAL

Custodians:

Army - ER
Navy - EC
Air Force - 17
NASA - NA

Review activities:

Air Force - 11, 70, 80
Navy - TD
* NASA - LRC, MSF

User activity:

Air Force - 19

Preparing activity:

Navy - EC

Agent:

DLA - ES

(Project 5961-1311)

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TABLE I. Group A inspection - Continued.

	MIL-STD-750		LTPD 1/					
Inspection	Method	Conditions	JANS	JANTX, JANTXV	Symbol	Min	Max	Unit
<u>Subgroup 4 - Continued</u>								
Turn-on delay time					$t_{d(on)}$			
2N6966		$V_{DD} = 34 \text{ V dc}$					30	ns
2N6967		$V_{DD} = 75 \text{ V dc}$					30	ns
2N6968		$V_{DD} = 175 \text{ V dc}$					35	ns
2N6969		$V_{DD} = 200 \text{ V dc}$					35	ns
Rise time					t_r			
2N6966		$V_{DD} = 34 \text{ V dc}$					60	ns
2N6967		$V_{DD} = 75 \text{ V dc}$					60	ns
2N6968		$V_{DD} = 175 \text{ V dc}$					30	ns
2N6969		$V_{DD} = 200 \text{ V dc}$					30	ns
Turn-off delay time					$t_{d(off)}$			
2N6966		$V_{DD} = 34 \text{ V dc}$					80	ns
2N6967		$V_{DD} = 75 \text{ V dc}$					80	ns
2N6968		$V_{DD} = 175 \text{ V dc}$					90	ns
2N6969		$V_{DD} = 200 \text{ V dc}$					90	ns
Fall time					t_f			
2N6966		$V_{DD} = 34 \text{ V dc}$					30	ns
2N6967		$V_{DD} = 75 \text{ V dc}$					60	ns
2N6968		$V_{DD} = 175 \text{ V dc}$					35	ns
2N6969		$V_{DD} = 200 \text{ V dc}$					30	ns
<u>Subgroup 5</u>								
Safe operating area test	3474	See figure 3, $V_{DS} = 80\%$ of rated V_{DS} and V_{DS} $\leq 200 \text{ V max}$						
High voltage dc SOA		$t_p = 1 \text{ s}$						
Electrical measurements		See table IV, steps 1, 2, 3, 4, 5, 6, and 7						
<u>Subgroup 6</u>								
Not applicable								

See footnote at end of table.

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TABLE I. Group A inspection - Continued.

	MIL-STD-750		LTPD 1/					
Inspection	Method	Conditions	JANS	JANTX, JANTXV	Symbol	Min	Max	Unit
<u>Subgroup 7</u>								
Gate charge	3471	Conditions A and B						
<u>Test no. 1</u>								
On-state gate charge					$Q_{g(on)}$			nC
2N6966						30	77	
2N6967						30	77	
2N6968						30	77	
2N6969						30	77	
<u>Test no. 2</u>								
Gate to source charge					Q_{gs}			nC
2N6966						4.6	18	
2N6967						4.6	18	
2N6968						4.6	18	
2N6969						4.6	18	
<u>Test no. 3</u>								
Gate to drain charge					Q_{gd}			nC
2N6966						13	40	
2N6967						13	40	
2N6968						13	40	
2N6969						13	40	

See footnote at end of table.